IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant: Børge KRINGELUM, *et al.*

Title: **METHOD FOR SUPPLY OF STARTER CULTURES HAVING A CONSISTENT QUALITY**

Appl. No.: 09/813,292

Filing Date: 3/21/2001

Examiner: Ruth A. Davis

Art Unit: 1651

Confirmation Number: 1783

REPLY BRIEF

Mail Stop Appeal Brief - Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Reply Brief is in response to the Examiner's Answer mailed June 27, 2007. Under the provisions of 37 C.F.R. § 41.41, this Reply Brief is timely filed within two months from the mailing date of the Examiner's Answer. Although no fee is believed to be associated with filing the Reply Brief, authorization is hereby given to charge any deficiency (or credit any balance) to the undersigned deposit account 19-0741.

The Argument begins on page 4 of this document.

STATUS OF CLAIMS

Claims 1-31 are finally rejected and are the subject of this appeal. The pending claims are presented in Appendix A of this Brief.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The grounds of rejection for review are as follows:

A. The rejection of claims 1-7, 11, 17-22, 24-27, and 29-31 under 35 U.S.C. § 103(a) over Sing in view of Kosikowski and Christensen.

B. The rejection of claims 1-7, 11, 17-22, 24-27, and 29-31 under 35 U.S.C. § 103(a) over Sing in view of Kosikowski, Christensen, and Czulak.

C. The rejection of claims 1-11, 17-22, 24-27, and 29-31 under 35 U.S.C. § 103(a) over Sing in view of Kosikowski, Christensen, and Lizak.

D. The rejection of claims 1-7, 11-22, 24-27, and 29-31 under 35 U.S.C. § 103(a) over Sing in view of Kosikowski, Vanderbergh, and Matsummiya.

E. The rejection of claims 1-7, 11, 17-22, 24-27, and 29-31 under 35 U.S.C. § 103(a) over Sing in view of Kosikowski, Czulak, and Lizak.

F. The rejection of claims 1-7, 11, 17-27, and 29-31 under 35 U.S.C. § 103(a) over Sing in view of Kosikowski, Rimler, and Lizak.

ARGUMENT

I. Evidence of record stands uncontested that the claimed invention affords results that are unexpected in view of the cited prior art

The invention of the appealed claims is directed to supplying starter cultures of consistent quality at different propagation factories or plants. The claimed methodology comprises, *inter alia*, providing a subset to a different propagation factory or plant, and inoculating the cultivation medium at the different propagation factory or plant with the subset of the stock inoculum material by ***direct, one-step inoculation*** to produce the starter culture.

By contrast, the conventional methodology represented by Sing requires stepwise inoculation procedures to obtain the final product. For instance, Sing discloses that an inoculum is used to inoculate a growth medium, then the inoculated medium is grown to produce a starter culture, and subsequently, milk is inoculated with the starter culture to obtain the dairy product. *See* column 1, lines 48-55.

In addition to reducing the production cost by implementing the one-step inoculation procedure, the claimed method lowers the risk of contamination, thereby providing cultures of a consistently high quality not presaged by the prior art. These advantages are attested to in the Rule 1.132 declaration by Børge Kringelum, which stands uncontested.

Thus, Table 1 of the Kringelum declaration demonstrates that implementation of the claimed method achieves an increased percentage of approved batches of cultures the results, surprising from the perspective of what was conventional (declaration, section 5). For instance, it is shown that the approval rate for batches inereased in six out of seven cultures tested, enhaneing overall product approval by 5.25% (*id.*, section 7). Moreover, conventional methodology was characterized by 38% approved batches of *B. bifidum* culture, which means that almost two-thirds of the production had to be discarded. In marked contrast, the claimed

method generated 100% approved batches of the same type of culture, underscoring that all production was of high quality and fully usable (*id.*, second row of Table 1).

The claimed method reduces the production cost "substantially" relative to the conventional methodology, because it does not embrace a stepwise inoculation procedure at each propagation factory, thereby decreasing the risk of contamination and increasing the approval rate of cultures. That the skilled artisan would have deemed this improvement both significant and unexpected is evidenced by the declaration (section 7, third paragraph) and unchallenged by the examiner.

The Examiner does not even address, let alone deflect, the evidence of record showing unexpected results associated with the claimed invention. The Board could and should reverse for this reason alone, even though additional errors by the Examiner, discussed below, vitiate the alleged *prima facie* case under Section 103.

II. The Examiner errs in discounting as "immaterial" admitted differences separating the claimed invention from the prior art

Numerous times the Examiner acknowledges that "the references do not teach the method wherein the subsets are provided to different factories and/or plants." See Answer at page 7, lines 13-14, page 11, lines 1-2, page 14, lines 19-20, page 19, lines 1-2, and page 23, lines 1-2, *inter alia.* Yet she contends that "the location of where the actual steps of inoculation take place does not patentably distinguish the method from the prior art, since practicing the methods at different locations would not materially change the step of inoculating mediums [*sic*] with subsets of stock inoculum" (*id.* at page 7, lines 14-17).

By this statement, it is evident that the Examiner errs by failing to consider the claimed method in ***whole*** and, instead, mistakenly focuses on a "single step method" not claimed by Appellants. Certainly, practicing at different locations, as claimed, does not change the single step of inoculation, *per se*, but the Examiner's observation to this effect is a *non sequitur*. It is

the combination of ***all*** recited steps that distinguishes the claimed invention over the prior art. That art would not have suggested – indeed, the Examiner does not contend it would have suggested – (1) providing a subset to a different propagation factory or plant and (2) inoculating the cultivation medium at the different propagation factory or plant with the subset of the stock inoculum material by direct inoculation. Thus, no reasonable permutation of teachings gleaned from the cited art could have led one of ordinary skill in the art to Appellants' ***claimed*** invention.

III. The Examiner's rationale for rejection is based impermissible hindsight

(A) The prior art does not meet the claim recitation of "different propagation factory"

As noted above, the Examiner does not contend that the prior art reasonably suggests the combination of steps comprising the claimed invention. Instead, she attempts to minimize the admitted difference separating the prior art from the claimed invention by lending a meaning to claim terms that deviates unjustifiably from conventional usage and, in fact, is illuminated by 20/20 hindsight.

The Examiner cites Kosikowski for the alleged teaching of transferring mother cultures into multiple growth media. According to the Examiner, "each growth medium could reasonably be interpreted as its own propagation factory of the starter culture as each medium is in a separate location." Answer, page 29, lines 1-4.

By any conventional definition, one cannot reasonably equate a "propagation factory" with a "growth medium." Kosikowski does not even suggest that the mother cultures are shipped to different propagation factories or plants for inoculation, let alone redefine the term "growth media" to mean "propagation factories." Therefore, there is no reasonable usage of the terms would have paralleled the meaning of the "growth medium" with that of the "propagation factory." The Examiner can only equate "multiple growth media" with "different propagation factories or plants" with the aid of hindsight.

In fact, Kosikowski teaches away from shipping the subset inoculum to different locations. The cited patent describes that "[a] mother culture is a small volume of inoculated growth medium, for example, cultured milk or whey which is periodically transferred, ***usually daily***, into a plurality of growth medium containers with the best resulting cultures selected for making a larger volume of starter, *e.g.* a bulk starter" (column 1, lines 24-29, emphasis added). Since the transfer of the mother culture into the growth media occurs daily, it is false that Kosikowski's mother cultures are shipped to different locations for inoculation. Therefore, one skilled in the art would not have equated different growth media with different propagation factories but fully appreciated the difference between inoculating different growth media in the same or adjacent labs and the ability to make possible coordinated effort by multiple facilities to homogenize the resultant product on a worldwide scale.

(B) The prior art does not meet the claim recitation of "the start cultures of consistent quality"

Furthermore, the Examiner relies on Christensen for the teaching of "starter cultures of consistent quality" recited in claim 1. In particular, the Examiner asserts that Christensen subjects the cultures to "quality tests" to ensure consistent quality. Nevertheless, there is no teaching or suggestion in the cited patent relates to minimizing batch to batch variation at different locations, which is embraced by the recitation of "consistent quality" in claim 1.

The Examiner interprets Christensen's "starter cultures that are uniform with their results" to have the same meaning as the "starter cultures of consistent quality" of the present invention, again, with the aid of hindsight. *See* Answer at page 7, lines 5-7. Christensen discloses that the desired culture is "uniform in [cheese-making] activity" (column 2, l. 19) and "uniformly and consistently produces cheese of high quality" (column 2, lines 46-47). Accordingly, the quality tests of Christensen are intended to "ascertain [the culture's] cheese-making qualities." *See* column 6, lines 6-7. One skilled in the art would have understood that the ability of cultures to make cheese is in an entirely different context than the ability of cultures

to ferment with minimum variation from batch to batch. Thus, the rejection is based on improper interpretation of the quality tests described by the cited patent.

In summary, the Examiner applied impermissible hindsight in an effort to make the cited art meet the claim recitations. Because the rejection is based on faulty rational, Appellants respectfully request that the rejection be reversed *in toto*.

IV. The quality tests prescribed by claim 29 are not those of Christensen

For the first time, the Examiner advances the argument that Christensen's activity tests read on the claimed test for metabolic activity and fermentation test. Specifically, the Examiner asserts that "Christensen clearly teaches plate counts (count of total viable cells) in addition to activity tests (which may include metabolic activity and fermentation tests as claimed)" (Answer, page 30, lines 4-6). Appellants disagree.

Claim 29 recites a Markush group of the tests, including Test for contamination, Count of total viable cells, Determination of colony morphology, Determination of purity, Determination of metabolic activity, Phage test, API test, Resistance to bacteriophages, Determination of the content of *Listeria* species and salmonella species, DNA fingerprint, and Fermentation test. These tests are performed to ensure a high quality starter culture that possesses high metabolic activity and a high cell number, is substantially contamination-free and bacteriophage-free and able to ferment, and consists of the desired bacteria. *See* specification, page 18, l. 16 through page 19, l. 16.

By contrast, Christensen describes the tests "to ascertain its cheese-making qualities," such as the "standard acid test," the "activity test" that is performed at different temperatures and that "shows the acid-producing characteristics of the culture," the "gas test," and "a standard plate count" (column 6, lines 5-50). Clearly, the activity test of Christensen for acidity production is not an equivalent of the claimed metabolic activity test or fermentation test, as the Examiner contends.

The claimed tests not only are for a different purpose but also encompass a much broader scope relative to the tests disclosed in the prior art. Therefore, one skilled in the art would not have considered it obvious to perform the claimed tests, armed with the teaching of the tests described by Christensen.

Appellants therefore renew their request that the Board reverse the rejection of claim 29 in whole.

CONCLUSION

For above-discussed reasons and those presented in their main brief, Appellants submit that the appealed rejections should be reversed and the pending claims allowed to issue.

Respectfully submitted,

Date 27 August 2007

By S A. Bent

FOLEY & LARDNER LLP
Customer Number: 22428
Telephone: (202) 672-5404
Facsimile: (202) 672-5399

Stephen A. Bent
Attorney for Applicant
Registration No. 29,768

APPENDIX A: CLAIMS INVOLVED IN APPEAL

1. A method of supplying starter cultures of consistent quality at different propagation factories or plants, comprising the steps of (i) providing inoculum material comprising starter culture organism cells, (ii) allowing the starter culture cells to propagate for a period of time sufficient to produce a desired amount of said starter culture organism cells, and (iii) harvesting the propagated cells to obtain a starter culture,

wherein step (i) comprises:

(a) concentrating said inoculum material of step (i) to obtain a concentrated stock inoculum material;

(b) dividing said concentrated stock inoculum material into subsets thereof and providing a subset to a different propagation factory or plant, each of said subsets having a quality sufficient to inoculate a cultivation medium at different propagation factories or plants, and

(c) inoculating said cultivation medium at the different propagation factory or plant with the subset of the stock inoculum material by direct, one step inoculation to produce said starter culture,

wherein said stock inoculum material is subjected to a quality test before use and is stored for at least 24 hours prior to said inoculating of the cultivation medium,

such that, when steps (ii) through (iii) are repeated with another subset of the stock inoculum material at a different propagation factory or plant, the supply of starter cultures has a consistent quality.

2. A method according to claim 1, wherein the inoculum material provided in step (i) is in quantities sufficient to inoculate at least 50,000 litres of cultivation medium.

3. A method according to claim 1, wherein the concentrated stock inoculum material provided in step (a) contains at least 10^8 CFU per g.

4. A method according to claim 1, wherein the subset of the stock inoculum material in step (c) is directly inoculated in the cultivation medium at a rate of maximum 0.1%.

5. A method according to claim 1, wherein the amount of the subset of the stock inoculum material for direct inoculation of the cultivation medium in step (c) provides a ratio of the CFU per g of cultivation medium, immediately after inoculation, relative to the CFU per g of the subset of the stock inoculum material being inoculated, said ratio being in the range from 1:100 to 1:100,000.

6. A method according to claim 1, wherein the cultivation medium immediately after the inoculation in step (c) contains a number of CFU per g of cultivation medium which is at least 10^5.

7. A method according to claim 1, wherein the cultivation medium in step (ii) comprises any conventional medium used for propagation of microbial cells.

8. A method according to claim 1, wherein the inoculum material and/or the subset of the stock inoculum material is in a state selected from the group consisting of a liquid, frozen and dried state.

9. A method according to claim 8, wherein the frozen subset of the stock inoculum material is thawed before direct inoculation of the cultivation medium in step (c).

10. A method according to claim 8, wherein the subset of the stock inoculum material is combined with an aqueous medium to obtain a suspension of the cells before direct inoculation of the cultivation medium in step (c).

11. A method according to claim 1, wherein the direct inoculation of the cultivation medium in step (c) is provided under aseptical conditions or under substantially aseptical conditions.

12. A method according to claim 1, wherein the stock inoculum material is supplied in sealed enclosures.

13. A method according to claim 12, wherein the sealed enclosures are made of a flexible material selected from the group consisting of a polyolefin, a substituted olefin, a copolymer of ethylene, a polypropylene, a polyethylene, a polyester, a polycarbonate, a polyamide, an acrylonitrile and a cellulose derivative.

14. A method according to claim 12, wherein the sealed enclosed are made of a flexible material comprising a metal foil.

15. A method according to claim 12, wherein the sealed enclosures have a cubic content of at least 0.01 litre.

16. A method according to claim 12, wherein the sealed enclosures are supplied with outlet means for connection of the enclosure to a container comprising the cultivation medium, said outlet means permitting the concentrate of cells to be introduced substantially aseptically into the container to inoculate the cultivation medium with said concentrate of cells.

17. A method according to claim 1, wherein the starter culture organism in step (i) originates from a species selected from the group consisting of a lactic acid bacterial species, a *Bifidobacterium* species, a *Propionibacterium* species, a *Staphylococcus* species, a *Micrococcus* species, a *Bacillus*, species, an *Actinomycetes* species, a *Corynebacterium* species, a *Brevibacterium* species, a *Pediococcus* species, a *Pseudomonas* species, a *Sphingomonas* species, a *Mycobacterium* species, a *Rhodococcus* species, an *Enterobacteriaceae* species, a fungal species and a yeast species.

18. A method according to claim 17, wherein the lactic acid bacterial species is selected from the group consisting of *Lactococcus* spp., *Lactobacillus* spp., *Leuconostoc* spp., *Pediococcus* spp., *Oenococcus* spp. and *Streptococcus* spp.

19. A method according to claim 1, wherein the inoculum material in step (i) comprises at least two starter culture strains.

20. A method according to claim 1, wherein the starter culture is a starter culture used in the food industry, feed industry or pharmaceutical industry.

21. A method according to claim 1, wherein the starter culture is used for inoculation of milk which is further processed to obtain a dairy product, which is selected from the group consisting of cheese, yogurt, butter, inoculated sweet milk and a liquid fermented milk product.

22. A method according to claim 1, wherein the cells being propagated in the cultivation medium express a desired gene product or produce a desired product.

23. A method according to claim 22, wherein the desired gene product is selected from the group consisting of enzymes, pharmaceutically active substances, polysaccharides and amino acids.

24. A method according to claim 22, wherein the desired product is selected from the group consisting of pigments, flavouring compounds, emulsifiers, vitamins, growth-stimulating compounds, food additives and feed additives.

25. A method according to claim 7, wherein the medium comprises one or more single milk components.

26. The method of claim 25, wherein one or more single milk components include skimmed milk.

27. The method of claim 1, wherein steps (ii) through (iii) are repeated with another subset of the stock inoculum material and wherein the supply of starter cultures resulting from each inoculation has a consistent quality.

28. The method of claim 1, wherein step (b) comprises providing a plurality of said subsets to different propagation factories or plants.

29. The method of claim 1, wherein the stock inoculum material or a subset thereof is subjected to a quality test selected from the group consisting of Test for contamination, Count of total viable cells, Determination of colony morphology, Determination of purity, Determination of metabolic activity, Phage test, API test, Resistance to bacteriophages, Determination of the content of *Listeria* species and salmonella species, DNA fingerprint, and Fermentation test.

30. The method of claim 1, wherein the stock inoculum material is stored for at least 48 hours prior to being added to the cultivation medium.

31. The method of claim 1, wherein the stock inoculum material or a subset thereof is transported or shipped to the different propagation factory or plant in a sealed enclosure.